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ABSTRACT

This paper is concerned with research issues that must be faced in assessing the potential subnational effects of proposed income maintenance programs. The paper is divided into discussions of four major tasks that must be performed by policy analysts. The first is simply to list program provisions that may have important subnational effects, either directly or by changing the behavioral patterns of participating families. The second task is to construct a set of socioeconomic indicators whereby these effects can be gauged in a manner readily comprehensible to policymakers. The third task is to develop a theoretical framework appropriate for analyzing these effects systematically. The fourth task involves actually obtaining the information necessary to predict the changes in the socioeconomic indicators that would result from adoption of the proposed income maintenance alternatives under consideration. Successful completion of these tasks depend on resolving a set of fundamental research issues that do not change as the geographic dimension of primary interest varies. Thus, although all the topics discussed in this paper are relevant to assessing the potential subnational implications of alternative income maintenance programs, many are equally pertinent to examining potential national effects. (Author/JM)

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MAINTENANCE PROGRAMS: A GUIDE TO POLICY ANALYSIS

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ASSESSING REGIONAL EFFECTS OF INCOME MAINTENANCE PROGRAMS:
A GUIDE TO POLICY ANALYSIS*

Julie DaVanzo and David H. Greenberg

The notion that the nation's welfare system has "failed" has become almost universally accepted, but hardly any consensus has developed on what should replace it. From a national perspective, this lack of agreement stems significantly from uncertainty over the ultimate cost of proposed alternatives to the present welfare system and the extent to which these alternatives would alter existing behavioral patterns of those who participate. From a subnational¹ point of view, the range of uncertainty is even greater. The issues here involve the implications of various proposals for state and local welfare budgets, the impact of these proposals on the geographic allocation of federal transfer payments to the poor, and the proposals' differential regional effects on various dimensions of human behavior. In fact, some of these behavioral effects, such as those influencing the migration of people or physical capital, are subnational by nature. Others, such as changes in labor supply, may differ substantially from one area to another.

This paper is concerned with research issues that must be faced in assessing the potential subnational effects of proposed income maintenance programs, a job that has barely begun. The paper is divided into discussions of four major tasks that must be performed by policy analysts if they are to help policymakers evaluate these effects. The first of these tasks is simply to list program provisions that may have important

*This paper is based on a larger study (Julie DaVanzo and David H. Greenberg, Suggestions for Assessing Demographic and Economic Effects of Income Maintenance Programs, R-1211-EDA, The Rand Corporation, June 1973) that was supported by the Office of Economic Research of the Economic Development Administration, Department of Commerce. The authors are grateful to Rand colleagues W. P. Butz, D. N. Fe Tray, P. Morrison, G. Nelson, and A. H. Pascal, and to T. P. Schultz of the University of Minnesota for commenting on earlier drafts of this paper.

¹In the term "subnational" we include any geographic entities--regions, states, cities, rural areas, urban areas, etc.--that are of policy interest. Except when otherwise indicated, our comments apply equally to all geographic units of interest.

subnational effects, either directly or by changing the behavioral patterns of participating families. Examples of spheres of individual or family behavior that income maintenance legislation may affect include labor supply, the propensity to migrate, investments in human capital (such as in schooling and on-the-job training), consumption patterns, the propensity to marry and to stay married, and fertility. The second task is to construct a set of socioeconomic indicators whereby these effects can be gauged in a manner readily comprehensible to policymakers. The third task is to develop a theoretical framework appropriate for analyzing these effects systematically. The fourth task involves actually obtaining the information necessary to estimate the magnitude of these effects, that is, to predict the changes in the socioeconomic indicators that would result from adoption of the proposed income maintenance alternatives under consideration.

Successful completion of these tasks depends on resolving a set of fundamental research issues that do not change as the geographic dimension of primary interest varies. Thus, although all the topics discussed in this paper are relevant to assessing the potential subnational implications of alternative income maintenance programs, many are equally pertinent to examining potential national effects.

PROVISIONS OF INCOME MAINTENANCE PROGRAMS

Income maintenance systems encompass one or more of the following program components: negative income tax plans, wage subsidies, government-created jobs, and income-in-kind programs such as food stamps and subsidized housing and medical care. The income maintenance programs most intensively investigated by social scientists and most seriously considered by Congress over the last few years, such as the Family Assistance Plan (FAP), are those incorporating negative income tax features; for purposes of illustration, we shall also generally refer to this type of program. However, most of the points we make are equally relevant to other types of income maintenance programs.

In discussing negative income tax programs (or other income maintenance programs), researchers have tended to emphasize the two most prominent program parameters: the base level of support and the tax rate. The base level of support defines the income guarantee--that is, a floor under household income. Viewed somewhat differently, the base

level of support is the *maximum* income transfer a household can receive under the program. In general, the transfer amount is reduced as more income is received from nonprogram sources. In effect this means that nonprogram income is taxed. The proportion of nonprogram income that is subtracted from the base level of support is commonly referred to as the program tax rate.

The values of the guarantee level and tax rate for any negative income tax plan actually implemented will probably vary among classes of households; their values for any single household are determined by other program provisions. Through these provisions households would be assigned to various administrative categories, each of which is associated with a unique set of tax rates and income guarantees. We briefly discuss these provisions under the general headings coverage, exemptions, work regulations, and other provisions.

Coverage

The type of coverage provided a given household is usually contingent upon the household's demographic characteristics, particularly the number of persons in the household, their age and sex, and the location of their residence. For example, under the existing welfare system or under various proposed forms of FAP, the base level of support increases with the size of the household. Many negative income tax proposals would also provide higher guarantee levels (and higher tax rates) for households headed by persons of retirement age. On the other hand, childless persons who have not yet reached retirement age are entirely excluded from program benefits under many proposals.

Exemptions

Under most negative income tax proposals, certain types of non-program income would be exempt from taxation. Moreover, even income that is defined as "taxable" may be subject to different tax rates, depending upon its source. For example, under FAP, the wage income of participants would have been taxed at a lower rate than their income from nonemployment sources.¹

Work Regulations

Many negative income tax proposals include a requirement that adult members of participating households who do not have child-care responsibilities register for work or training. The usual penalty for failure

¹See, for example, H.R. 1, June 1971.

to comply is a reduction in the household's base level of support.

Other Provisions

Some participants in any negative income tax program actually implemented will probably also be eligible to participate in other income maintenance programs, such as social security, unemployment compensation, health care subsidies, day-care services, food stamps, and public housing. These programs often incorporate income guarantees or tax rates of their own. Depending on various program provisions, coverage under these additional programs will vary among the households participating in a negative income tax plan. As a result, when the full set of income maintenance programs is taken into account, different classes of households will be provided with different levels of basic support and subjected to different tax rates.

Guarantee levels and tax rates for households are also likely to vary by geographic location. The precise extent of geographic variation, however, will be contingent upon program provisions for cost-of-living adjustments and for state supplementation of federal income transfers. Proposed legislation to replace the present welfare system by a program such as FAP would tend to dampen, but not eliminate, existing regional variation in program parameters.

Another program provision that may have an influence on the transfer amounts received by different households is the length of the accounting period over which program benefits are calculated. For example, if the accounting period is six months long, it is possible under some negative income tax proposals for a household that receives all of its nonprogram income during the first six months of a given year to qualify for program benefits during the last six months, whereas a similar household, receiving the same *annual* nonprogram income but in equal parts throughout the year, does not qualify.

SOCIOECONOMIC INDICATORS

An important requirement for analysis of income maintenance programs is the formulation of socioeconomic measures that clearly show program effects to policymakers. The goal of income maintenance research should be to predict accurately the values of such indicators under alternative programs. Comparisons with pre-program values for these indicators would

then allow potential program-induced changes to be estimated. The indicators should be sufficiently flexible to satisfy the particular needs of different sets of policymakers--for example, those at the regional as well as the national level--but there must not be so many of them as to overwhelm their users in a sea of numbers.

Projected changes in the indicators should be calculated for various geographic regions, as well as for the nation as a whole. Some of the potential effects of income maintenance programs, such as the migration of people or physical capital, are essentially subnational by nature and will cancel out if examined only at the national level. In addition, for several reasons, even effects that can be measured at a national level, such as changes in labor supply, may differ substantially among areas. First, as mentioned above, the provisions of an income maintenance program may vary geographically. Second, the proportion of persons eligible for income maintenance payments will not be the same in each location since some areas contain more poor families than others. Third, the demographic composition of various subnational populations differs, and different demographic groups--for example, various age groups--may respond differently to an income maintenance program. Fourth, behavioral response parameters, even for a given demographic group, may vary geographically. Computing changes in the indices for separate geographic areas permits examination of the regional allocation of program transfer payments. It also allows assessment of the effects of alternative income maintenance programs on each region's economy.

The indicators must convey several different types of information. These are discussed below.

Effects on Poverty

Presumably, the *raison d'être* for income maintenance programs aimed at the poor is the mitigation, if not the eradication, of poverty. The effectiveness of a program as an anti-poverty device is perhaps most naturally measured by comparing the number of persons or households who would be poor if the program were implemented with the number who would be poor were it not. One difficulty with this measure is in finding an operational definition of "poverty." A poverty line--a money income level sufficiently high to bring a family out of poverty--must be determined. The most commonly used poverty lines are federal standards,

which were initially developed in 1964 by the Social Security Administration and are adjusted annually for changes in price levels. Although most users of these standards acknowledge that they are arbitrary, and considerable controversy rages over whether they are set too high or too low, they are probably adequate for comparing alternative income maintenance programs.

It may not be sufficient to compare these programs by simply counting the *number* of persons or families who cross a poverty line. A program that concentrates only on those whose incomes are slightly below the poverty line may be judged superior to another program that actually did more to *reduce* poverty but concentrated on those whose incomes are far below the poverty line. It may be better to assess the effects of the program on the basis of the total amount by which *incomes* that fall below the poverty line are in fact raised (that is, by how much the aggregate "poverty gap" is reduced).

Budgetary Costs

Public discussions of the "costs" of proposed income maintenance programs are usually concerned with the amount of income transfers that will actually be paid, the administrative costs, and changes in expenditures in existing programs that are associated with the introduction of the new programs. It is particularly important that such budgetary costs be projected separately for different units of government, since a budgetary increase at one level of government, say the federal, may in part be offset by a budgetary decrease at another level, say the state. Had FAP been implemented, this might have been one of its more important effects.

Market Output

Changes in transfer payments expenditures do not necessarily reflect program effects on the real resources that are used by an economy. These effects, however, will be partly reflected by program-induced changes in the earnings of participants--a measure of the market output these persons produce--and, at a more aggregate level, by changes in the Gross National Product or in measures of regional output. Relative expenditures for various market goods and services may also change. Such change would occur if the program causes adjustments in the behavior of participants--for

example, in the number of hours they supply to the labor market or in their geographic mobility. These behavioral changes and their relation to the socioeconomic indicators are discussed in greater detail later.

Demand for Government-Provided Goods and Services

Program-induced changes in behavior may result in increased or decreased use by the poor of such publicly provided goods and services as education, medical care, and the State Employment Service. From one point of view, such changes will be reflected by the budgetary expenditures for these services, but from another point of view, they may appear as changes in the educational attainment and the wage rates of the poor.

Distribution of Income

Almost by definition, the income transfers provided by a new income maintenance program will change the distribution of income among income classes, demographic groups, and geographic regions. Projection of these changes will indicate which groups will be *relatively* better off and which will be relatively worse off. Potential program distributional effects may be estimated by projecting the total post-program disposable personal income of each income group.

Population Distribution

Later, we suggest a number of reasons why income maintenance programs may influence family migration decisions. Program effects on migration should, of course, be indirectly reflected by the socioeconomic indicators that are used to measure many of the program effects discussed above, such as those on market output within a geographic area, on interregional income distribution, and on state and local welfare budgets. Nevertheless, migration is a sufficiently important policy area that policymakers should also be provided direct measures of program-induced changes in the number and demographic composition of migrants to and from various regions.

Dissatisfaction on the Part of Nonparticipants

Income maintenance programs that cause uneasiness among nonparticipants, many of whom pay for the program, are likely either not to last very long or to place considerable stress on the social fabric; the current welfare system is a good example of the latter. Thus, it is useful to anticipate potential sources of such dissatisfaction as early as possible.

Several of these, such as budgetary costs and income distributional effects, are captured by some of the indicators already mentioned. Two other potential sources of dissatisfaction on the part of taxpayers may be (1) reductions in work effort by transfer payment recipients, as measured by changes in the number of such persons who participate in the labor force and in the number of hours they work, and (2) increases in the number of persons receiving transfer payments--that is, increases in the welfare case load.

Nonmarket Activities

Although the indicators listed above are rather conventionally used, they tend to provide only limited perspective on program effects on the social welfare. For example, changes in the aggregate poverty gap or in family income are usually measured in dollar terms. However, if, after a program is implemented a family withdraws so many hours from the labor market that its money income actually decreases, this does not mean that the family now perceives itself as being worse off. Reduction of its time in the labor market indicates that it now feels this time is more valuably spent engaging in nonmarket activities. A family's well-being includes the value of time outside the labor market as well as its value in the market. This is an important element of the "household production model," a theory of family decisionmaking that is discussed in the next section.

PROGRAM-INDUCED CHANGES IN BEHAVIOR

Accurate predictions of program-induced changes in economic indicators, such as those just discussed, cannot be obtained without knowledge of how people change their behavior in response to various program provisions. Obtaining such knowledge depends on guidance from a conceptual framework that identifies possible causal links between specific factors in families' surroundings and specific aspects of people's behavior. Such a framework serves four functions: (1) It directs the researcher's attention toward aspects of behavior that may be significantly, though perhaps only indirectly, affected by an income maintenance program. (2) It indicates the specific characteristics of data needed to identify which of the causal links suggested are actually quantitatively important. (3) It specifies the characteristics of the empirical model that will be estimated with data. (4) It helps

determine the correct statistical method to be used in estimation and inference.

The conceptual framework that we feel is most appropriate for examining the behavioral implications of income maintenance programs is the "household production model."¹ This model has several important advantages for such studies: (1) The family is the decisionmaking unit in this model; decisions about the types of behavior likely to be affected by welfare reform are made in a family context; (2) the model has been extended to study changes in family behavior *over time*; (3) the model measures individual and family well being by their "full income"--the value of all their time, including time spent in productive nonmarket activities such as rearing children--and not merely by their money income and thereby allows many different dimensions of behavior to be analyzed.

The essential characteristics of this model have been succinctly summarized by Smith:²

The family is viewed as if it were a small firm producing its ultimate wants within the household. To satisfy these wants, the family (firm) purchases market goods and services as one input in the production process.... The novelty and content of the household model come from the assumption that purchased market goods are not the sole inputs used by the family. Instead, households combine market goods with the time of various family members in order to achieve more basic desires. Families are therefore implicit demanders of their own scarce time resources. To illustrate: the commodity "enjoyment of a play" is ultimately consumed by purchasing directly such market goods as a theater ticket, travel to and from the theater, and babysitting services. Also, a considerable amount of time (which has alternative uses) of those family members who are

¹See Gary Becker, "A Theory of the Allocation of Time," *Economic Journal*, Vol. 75, September 1965, pp. 493-517, and Kelvin J. Lancaster, "A New Approach to Consumer Theory," *Journal of Political Economy*, Vol. 75, April 1966, pp. 132-157, for the seminal articles on this model. For expositions of this model in the context of welfare reform analysis, see Dennis N. De Tray, *A Conceptual Basis for the Study of Welfare Reform Effects*, R-1066-DOC, The Rand Corporation, Santa Monica, September 1972; Dennis N. De Tray, *A General Economic Framework for Welfare Reform Analysis*, R-1346-OEO, The Rand Corporation, July 1973; and James P. Smith, *Family Decisionmaking Over the Life Cycle: Some Implications for Estimating the Effects of Income Maintenance Programs*, R-1121-EDA/OEO, The Rand Corporation, November 1973.

²James P. Smith, *Op.Cit.*, p. 6-7.

involved is used up (in watching the play) and must properly be viewed as part of the full cost of consumption....

This approach differs from the traditional one since the price of *any* commodity now has two components--the money goods price and the time price. The latter has been generally neglected in the traditional approach, but both receive equal prominence in the theoretical structure of the new model. The relative empirical importance of the two components depends, of course, on their respective shares in the cost of producing an activity.

This model and other considerations indicate that behavioral changes following the introduction of an income maintenance program can be traced to three major sources:

1. A new program will change the income and wealth positions of some households, consequently changing the amount and possibly the mix of "commodities" these households consume. Since these commodities are produced at home by combining market goods and the time of family members, a change in the demand for commodities will affect the derived demands for time and goods, and hence the household's allocation of time among home and labor market activities and its purchases of market inputs may change.
2. Some types of income may be taxed more heavily under the program than others. One would expect households to tend to shift their efforts toward obtaining those types of income that are subject to relatively low tax rates. Moreover, there is one particular type of "income" that will not be taxed at all: the value a household places on goods and services that it does not purchase in the market place but produces itself (home repairs, for example). In other words, time exchanged for market goods and services--time in the labor market--is taxed under income maintenance programs, but time spent producing nonmarket goods and services or used directly in consumption activity is not. As a consequence, household commodities that require large inputs of goods and services purchased in the market become more expensive to households relative to those that require large amounts of nonmarket time. The relative consumption of the first type of commodity should, therefore, decline.
3. It was noted earlier that income maintenance programs usually establish various categories, each associated with a different set of tax

rates and income guarantee levels. Other things equal, households will tend to tailor their behavior (by getting married or having a child, for example) so that they will be placed in the category that offers them the most advantageous terms.

The ways in which these factors operate to change behavioral patterns are best illustrated by discussing the dimensions of behavior that might be affected by an income maintenance program and by indicating how changes in the socioeconomic indicators discussed above will reflect these behavioral changes.

CHANGES IN LABOR SUPPLY

Several different provisions of negative income tax programs may affect the labor supply of participating households. First is the income subsidy paid under such programs. Workers can use at least part of this subsidy to replace earnings given up by choosing to work fewer hours. In other words, the subsidy can be used to "purchase" time to engage in nonmarket activity. Second, such programs impose a tax rate on earnings, thereby changing the amount of market goods and services that can be obtained in return for an hour's work, but not the value of productive time spent outside the labor market. Third, program provisions may stipulate that under certain conditions failure to accept a job offer will cause the amount of the subsidy to be reduced.

The range of empirical estimates of the labor supply response to the introduction of an income maintenance program is currently unacceptably large. For programs similar to the Family Assistance Plan, estimates of the rational labor supply reduction for prime age males based on non-experimental data have ranged from 0 to over 30 percent;¹ the information so far available from income maintenance experiments implies that little reduction in the hours of prime age males will take place.²

¹See G. C. Cain and H. Watts (eds.), *Income Maintenance and Labor Supply: Econometric Studies*, Markham Press, Chicago, 1973; and Julie Da Vanzo, Dennis N. DeTray, and David H. Greenberg, *Estimating Labor Supply Response: A Sensitivity Analysis*, R-1372-OEO, The Rand Corporation, Santa Monica, December 1973.

²See the papers on the New Jersey Income Maintenance Experiment in the Spring 1974 issue of the *Journal of Human Resources*.

Especially little is as yet known about whether labor supply parameters vary geographically, although preliminary evidence from at least one study suggests that regional variation may be rather substantial.¹ There are a number of reasons to anticipate such variation. For example, "tastes" for work will vary with the influence of the work ethic or the precept that "a woman's place is in the home." Factors such as the weather and nearby recreational opportunities will directly influence the opportunity costs of time in the market. Similarly, houses may require more time for upkeep in some areas than in other areas, or some regions may offer greater opportunity for nonmarket production, such as growing one's own food. On the other hand, it may be relatively less expensive in some regions to substitute market goods or services for one's own time in household production. The relatively low price of servants in some parts of the South is the most obvious example.

Policymakers have at least five reasons to be concerned about the magnitude of the labor supply response to the introduction of an income maintenance program:

1. The number of hours worked is a major determinant of the amount of goods and services produced by the economy.
2. The transfer costs of the program depend on the work effort of participants. For example, if participants reduce their hours of market work, thereby causing their earnings to fall, part of this loss of earnings will be replaced by program-sponsored income transfers.
3. Presumably one goal of policymakers in designing income maintenance programs for the poor is to improve participants' money incomes. Since most negative income tax programs would replace only part of any earnings loss resulting from an hours reduction, such a reduction would lessen program effectiveness in increasing the money incomes of the target population.

¹David Greenberg (*Income Guarantees and the Working Poor in New York City: The Effect of Income Maintenance Programs on the Hours of Work of Male Family Heads*, R-658-NYC, March 1971) has estimated labor supply functions for (1) a national sample, (2) central cities, (3) large central cities, and (4) New York City. He has found the parameters to differ considerably among the four samples.

4. The political acceptability of the program also hinges on its effect on labor supply. The Protestant ethic implies that work is good per se and especially good for the poor. Thus, policymakers and taxpayers seem much less resistant to subsidy payments that are used by poor households to purchase goods and services than they are to payments used to replace earnings losses caused by a reduction in market work.

5. Changes in hours worked may alter the geographic allocation of the supply of low-wage labor, especially if wage and income response parameters vary geographically. Thus, firms may relocate.

These areas of concern are to some extent accounted for by the socioeconomic indicators discussed earlier. For example, attitudes of taxpayers toward the program and its participants are likely to be most affected by the magnitude of the changes in hours itself and by changes in the number of welfare recipients who participate in the labor force. However, changes in the output of market goods and services that these hours adjustments entail are best measured by aggregate changes in earnings. Program budgetary costs are directly measured by the change in total welfare transfer payments resulting from implementation of the program, and program effectiveness in improving the money incomes of the poor is reflected by changes in the total disposable personal income of participants and by changes in the aggregate poverty gap. If knowledge of program-induced labor supply adjustments were available, the importance of these adjustments could be estimated by comparing (1) projections of the changes that will occur in total welfare transfer payments, the aggregate poverty gap, and participants' total disposable personal income with (2) what they would be if the labor supply remained unaltered.

CHANGES IN MIGRATION FLOWS

Among other reasons, people may migrate because a new area offers better employment opportunities, greater consumption returns (for example, a superior climate or the opportunity to live closer to relatives), lower living costs, and, perhaps, in the case of some poor families, superior income maintenance programs. By changing the level of income supplements available to certain households and the set of tax rates that these households face, any new income maintenance program will affect the likelihood

of moving for one or more of these reasons. The mechanisms through which these factors operate are briefly summarized here.¹

The income supplement associated with a negative income tax program will increase the gross flow of migrants by facilitating the financing of migration, subsidizing job search, and providing income insurance in a new area. On the other hand, the tax rate on earnings, if higher than those the family is currently facing, will reduce a recipient family's potential earnings in all locations and thus decrease the absolute earnings differential available by moving to a new location; this is expected to weaken the incentive to search for and migrate for better job opportunities. However, a higher tax rate will also reduce any earnings foregone during the time the migrant is between jobs. This will tend to mitigate the negative effect on migration of a smaller labor market return.

At present the average monthly welfare payment per recipient varies considerably among states.² It has been alleged that these interstate discrepancies encourage "nonproductive" migration from low-benefit states to those with more attractive programs.³ Congressionally enacted welfare

¹These are discussed in greater detail in Julie Da Vanzo, *An Analytical Framework for Studying the Potential Effects of an Income Maintenance Program on U.S. Interregional Migration*, R-1081-EDA, The Rand Corporation, Santa Monica, December 1972; and Julie Da Vanzo "Assessing the Potential Impact of Income Maintenance Program on Migration: Hypotheses and Suggestions for Research," P-5006, The Rand Corporation, Santa Monica, May 1973.

²For example, in 1966 the average AFDC grant per recipient was \$8 per month in Mississippi, but \$48 per month in New York. R.A. Cloward and F. F. Piven, "Migration, Politics, and Welfare," *Saturday Review*, November 16, 1968, point out that eligibility requirements and administrative procedures also exhibit considerable interstate variation.

³For examples of such allegations see the list of quotes in Robert D. Reischauer, "The Impact of the Welfare System on Black Migration and Marital Stability," Columbia University, Ph.D. dissertation, 1971, p. 68, footnote 74. Available evidence does not lend very strong support to the hypothesis that (potential) welfare recipients tend to move to areas with attractive welfare programs. However, most studies have considered only interregional discrepancies in benefits, neglecting differences in eligibility requirements and administrative procedures.

reform measures are likely to establish national standards that reduce the discrepancies in interstate welfare payments, although the extent to which this happens will depend on provisions for state supplements and cost-of-living adjustments. This should reduce any existing welfare-motivated migration. In addition to the effects of income supplements and tax rates, income maintenance programs may also facilitate migration through provisions for moving allowances, job locations, and information services.

Partly because of the multiplicity of possible effects on migratory patterns by proposed income maintenance programs, existing empirical studies of migration are inadequate for predicting how net migration between given pairs of regions would be affected. In fact, it is not even clear at the present time whether these programs would increase or decrease the proportion of the population that annually migrates. It is important, however, that policymakers be provided with this information; along with the other program behavioral effects, the changes in the sizes and compositions of regional populations that result from the effects of income maintenance programs on the volume, direction, and demographic composition of migration flows will determine the regional distribution of program transfer payments. Program-induced population redistribution also can be expected to have important consequences for regional economic growth and development.

CHANGES IN CONSUMPTION PATTERNS

Changes in income levels and tax rates that result from the introduction of a new income maintenance program have obvious implications for consumption patterns. For example, if income increases, other things equal, a family will buy larger quantities of all goods whose income elasticities exceed zero, and will especially increase its consumption of commodities with very high income elasticities.¹ Some of these increases in expenditures will be recirculated through the economy and, through "multiplier effects," should generate additional increases in expenditures, outputs, and

¹ A staff study sponsored by the President's Commission on Income Maintenance Programs tentatively concluded that "for most [poor] persons 50 to 70 percent of any increment in income will be spent on the three basics, food, clothing, and shelter" and that "substantial portions of additional expenditures would be devoted to transportation, tobacco, and alcoholic beverages, and reading, recreation, and education." Chapter 4.1 on "Household Consumption," in *Background Papers*, President's Commission on Income Maintenance Programs, 1970, pp. 79-84.

incomes.¹ These will be reflected by changes in disposable personal income and in other socioeconomic indicators for the nation as a whole and for subregions.

However, the extent and direction of multiplier effects are unclear, *a priori*. First, any change in transfer income receipts that follows the adoption of an income maintenance program may be at least partly offset by an opposite change in earnings. This would occur, for example, if a program that increases transfer receipts also induces a reduction in hours of work and, hence, in earnings. Second, if a new program is funded through a tax increase, any increase in transfer income received by participating families may be offset by a corresponding reduction in the disposable personal income available to nonparticipating families. Of course, if the marginal propensity to consume of the low-income recipient population exceeds that of the nonrecipient population, positive multiplier effects may still be produced. Moreover, the geographic distribution of income is almost certain to change. Thus, positive multiplier effects may be produced in regions with a disproportionate number of poor persons and negative multiplier effects occur in wealthier areas.

In addition to changing the magnitude and composition of recipients' income, an income maintenance program that taxes wages will change an important component of the cost of consumption: the price of time. As mentioned previously, such a program would tax time spent working (market time), but would not tax productive nonmarket time. Increases in the tax rate on earnings resulting from the introduction of an income maintenance program will cause commodities that use large inputs of nonmarket time to become less expensive relative to those using a large proportion of market goods and services. "Enjoyment of Children" is one such time-intensive commodity. An increase in the tax rate on earnings may make children more attractive to households because the earnings that are foregone by staying home and caring for them have, in effect, been reduced.

¹For a more detailed discussion of the macroeconomic implications of a negative income tax program, see Christopher Green, "A Macroeconomic Analysis of the Economic Impact of Negative Income Taxes," in *Technical Studies*, President's Commission on Income Maintenance Programs, 1970, pp. 101-119.

Another feature of specific forms of income maintenance legislation that may also increase the demand for children is the provision in many proposed programs that no family can receive benefits unless it has at least one child. In addition, even after a family qualifies for benefits, the guarantee level under many proposed income maintenance programs is positively related to family size. For example, under H. R. 1 the marginal value of the first child to a couple with nonprogram income would have been the base level of support, \$2000 a year; the marginal values of a second and third child, \$400 each. Thus, if a child adds less to household costs (both psychic and monetary) than the value of welfare benefits, the family might restyle their lives--that is, have a child they might not otherwise have had--in order to move into the recipient class or receive additional benefits. Furthermore, some programs include provisions for subsidized day care. This may have a positive effect on desired family size by reducing the time cost of children.

Through its income and price effects, the imposition of an income maintenance program will affect a family's demand for publicly provided services as well as its demand for private goods. Important examples of such services are publicly funded schools and subsidized medical care. The money price of these services to recipients is either zero or very low. A major (if not the only) cost of such services to the recipient is the time that must be used in their consumption.¹ In other words, the consumption of public goods tends to be very time intensive. Thus, any increase in tax rates that results from imposition of a negative income tax program should produce an increase in the demand for public goods.²

¹Recent empirical studies of the demand for medical services have indicated that time-price elasticities tend to rise as money prices fall. See Jan Acton, *Demand for Health Care Among the Urban Poor, with Special Emphasis on the Role of Time*, R-1151-OEO/NYC, The Rand Corporation, Santa Monica, April 1973; and Charles Phelps and Joseph Newhouse, *Coinurance and the Demand for Medical Services*, R-964-OEO, The Rand Corporation, Santa Monica, April 1973.

²A tax on earnings will reduce the time price of consuming public goods for individuals with market options for their time; it will not necessarily increase the demand for such goods for persons who do not customarily participate in the labor force, for example, young children. An increase in tax rates on wages may encourage older children to stay in school longer but have little effect on school attendance by younger children.

CHANGES IN HUMAN CAPITAL INVESTMENTS

The primary types of investments made by likely participants in income maintenance programs are those in their own human capital--schooling, on-the-job training, and so forth. Since investments in human capital typically require sizable inputs of time, the effects of changes in income levels and tax rates on such investments should be similar to the effects of such changes on time-intensive commodities. For example, an increase in tax rates on earnings would be expected to increase the demand for job training and other forms of human capital by reducing the opportunity costs of such investments.¹ Program-associated increases in income levels should increase the demand for investments in human capital by facilitating their internal financing.²

The fact that income maintenance programs place a floor under income may also encourage investments in human capital because many forms of investments in human capital, such as migration, job search, and specialized training, tend to be relatively risky ventures; by reducing future variance of income, the income floor reduces the risk associated with the investment.

Therefore, any new income maintenance program that raises the income levels and tax rates of its participants is also likely to increase the number of households willing to invest in human capital. Assuming a corresponding increase in the supply of sources of those investments, such as training facilities, the long-run result could be an increase in the market earnings of such families and, hence, a decrease in their participation in the programs.

¹However, this incentive may be offset if post-investment earnings remain sufficiently low that the investor is still eligible to participate in the program. In this case, the tax rate will lower the eventual return expected as a result of investments in human capital.

²The receipt of program funds may also increase a person's ability to borrow from external sources because the income floor decreases the risk of default.

OBTAINING INFORMATION ON THE EFFECTS OF INCOME MAINTENANCE PROGRAMS

Our previous discussion indicates that to measure the effects of income maintenance programs, one must first estimate the direction and magnitude of behavioral responses to program-related changes in wage rates and family income. The two principal alternative approaches to obtaining information on how wage and income changes affect behavior are through data generated by controlled social experiments and through inferences from non-experimental data collected by household surveys.

Under either approach, a critical issue for determining the regional implications of income maintenance programs is the extent to which behavioral responses to wage and income changes vary geographically. To minimize administration costs, social experiments are almost always confined to relatively small geographic areas; thus, the question of their applicability to regions not covered by the experiment is of obvious importance. As opposed to experimental data, most of the better non-experimental data are based on national samples of households. However, it is frequently impossible to divide a national sample into subsamples that closely correspond to the regions of interest.¹ In addition, as a sample is subdivided, subsamples can become quite small. This problem is compounded because, in addition to regional variation in behavioral parameters, it is also important to know whether the parameters vary by size of place, age, race, sex, and so forth. As the number of observations in a subsample shrinks, the reliability of inferences based on that subsample is weakened.

THE EXPERIMENTAL APPROACH

Under the social experiment approach, a sample of selected households is randomly divided into subgroups. Wage and income conditions are then made to vary among the groups and the behavior of the groups compared. For example, households that participate in a pilot program can be compared with a control group of similar households that do not participate.

¹ Ideally, one would like to have data that give the household's area of residence by a relatively small geographic unit, such as state, SMSA, or county. Unfortunately, many household-level data sets suppress detailed information on residence to maintain confidentiality and provide information only on larger geographic units such as the nine Census divisions or four Census regions. The level of geographic detail available in five individual-level data sets is noted in Da Vanzo and Greenberg, Op. Cit., pp. 67-71.

The obvious advantage of this approach is that it allows behavioral response conditions to be estimated under circumstances that are as close as possible to those that would exist under an actual program. Nevertheless, it is not really possible to duplicate program conditions accurately in all respects. Results from an experiment may be distorted by the intrusion of unforeseen changes in environmental conditions that are not subject to experimental control¹ or by households that do not adjust their behavior during a temporary experiment in the same way they would if the change were permanent.² An additional problem is the so-called Hawthorne Effect: Families who are being observed continuously may behave differently from other families with similar characteristics simply because they are being studied.

Possibly the most serious drawbacks of social experimentation have to do with cost and time constraints. Such experiments are relatively costly, although it is important to recognize that much of the "cost" in an income maintenance experiment may be payments made to the low-income persons participating in the experiment. Nevertheless, administrative costs are sufficiently large that experiments tend to be carried out in fairly narrow geographic areas, bringing into question the applicability of their results to all regions of interest. In addition, experiments do not generate results until considerable time has elapsed; policymakers may not be willing to wait until relevant experimental results are available.

THE NONEXPERIMENTAL APPROACH

Because experimental data are expensive and time-consuming to generate and are subject to biases of unknown magnitude, it is important to consider estimating behavioral parameters from nonexperimental data, especially data that are already available. Particularly important is the use of such data

¹For example, interpretation of the results of the income maintenance experiment in Seattle was severely complicated by a drastic increase in the city's unemployment rate during the experimental period. See Mordecai Kurz and Robert G. Spregelman, "The Seattle Experiment: The Combined Effect of Income Maintenance and Manpower Investments," *The American Economic Review*, 61, No. 2, May 1971, 22-29.

²See Charles Metcalf, "Making Inferences from Controlled Income Maintenance Experiments," *American Economic Review*, June 1973, and James P. Smith, *op. cit.*

to test whether behavioral response parameters vary across regions, thereby helping to determine whether the results of a social experiment carried out in one geographic area are applicable to other areas.

As in the case of social experiments, making inferences from non-experimental data involves comparing the behavior of households for whom wage or income conditions differ. With nonexperimental data, differences among households are not artificially induced but are observed under existing conditions; this approach is sometimes referred to as a "natural experiment." Unlike controlled experiments, differences among households in variables other than those of policy interest cannot be "held constant" by dividing a sample into randomly selected experimental and control groups but must be controlled through various statistical techniques.

Although progress has been made in learning how to use nonexperimental data to estimate behavioral parameters, substantial gaps remain and empirical results have so far been of limited usefulness to policymakers. There are several reasons for this. Even though the conceptionally correct definitions of the variables whose relationships are to be estimated are usually clear, the transition from theoretically correct variables to measurable variables is extremely difficult. The statistical technique used for estimating the relationships among the variables, once measured, must deal correctly with the simultaneity in household decisionmaking; that is, it must take account of the fact that one type of behavioral response by an individual--say, a labor supply adjustment--is interdependent with other areas of behavior and with the characteristics of other members of the household. Finally, the relations estimated between the variables may be very sensitive to the sample of households or individuals that is drawn from the nonexperimental data.

The least tractable of the problems involved in estimating the behavioral parameters tend to derive from the same source: In a "natural experiment" there may simply be too few occasions when circumstances sufficiently approximate those that would occur upon introduction of an income maintenance program; that is, we may seldom, if ever, observe in nonexperimental data families' reactions to truly exogenous changes in wage rates and income. Changes in these variables that would result from introduction of an income maintenance program are outside the affected households' control. Wage and

income differences that are observed in nonexperimental data, however, may have been strongly influenced by decisions made by the sampled households.

CONCLUDING SUMMARY

Table 1 summarizes many of the issues discussed in this paper. The first four columns of the table indicate how various behavioral areas may be affected by the different provisions of income maintenance programs. The directions of the effects are also indicated whenever possible. For example, the income guarantee associated with most income maintenance programs is expected to reduce hours of work by serving as a substitute for earnings; but to increase migration by helping to cover the cost of moving to a new area and of searching for a new job, and by providing some income "insurance" if a new job cannot be immediately found. Various behavioral effects of program tax rates and other program provisions are also listed in the table.

Table 1 also implies that behavioral responses to program provisions are, in turn, reflected in changes in different types of socio-economic indications. Since most of the behavioral effects will, in one way or another, affect most socio-economic indicators only a single arrow is used to suggest the relation. For example, among other things, labor supply effects determine the distribution of transfer payments under a program, the market output produced by program participants, and the ultimate cost of the program. Program migratory effects would change the interregional income distribution, market output within an area, state and local welfare budgets, and, of course, the population distribution.

In addition to indirectly affecting the indicators through behavioral adjustments, income maintenance programs directly change several types of socio-economic indicators vis-a-vis transfer payments. That is, certain indices, such as those indicating the extent of poverty or how income is distributed, would be affected by transfer payments even if no behavioral adjustments were made to adoption of an income maintenance program. The size of these transfer payments, as the right hand side of Table 1 indicates, is determined, of course, by program tax rates, guarantee levels, and other program provisions.

Table 1 suggests that for some behavioral areas, such as labor supply, we can be fairly certain a priori about the direction of the effects of income

TABLE 1

EFFECTS OF PROGRAMS PROVISIONS ON SELECTED
BEHAVIORAL AREAS AND SOCIO-ECONOMIC INDICATORS

Program-Induced Changes in Behavior			Behavioral Areas		Socio-economic Indicators		Program-Effects on Socio-Economic Indicators	
Program Provisions			Other Possible Provisions		Tax		Program Provisions	
Guarantee			Income Effect:				Guarantee	
Substitution Effect:								
- Reduces opportunity costs of not working	+ Facilitates internal financing	- Reduces geographic wage differentials	+ Purchase time for non-market activities	+ Work requirements	LABOR SUPPLY	MIGRATION	EFFECTS ON POVERTY	PROGRAM BUDGETARY COSTS
+ Reduces opportunity costs	+ Facilitates internal financing	- Reduces geographic wage differentials	+ Provides income insurance in new area	+ May provide moving allowances or information service	CONSUMPTION PATTERNS DEMAND FOR PRIVATE GOODS	DEMAND FOR PUBLIC GOODS	USAGE OF GOV'T GOODS AND SERVICES	DISTRIBUTION OF INCOME
- Reduces opportunity costs	+ Facilitates internal financing	- Reduces geographic wage differentials	Shifts demand toward time intensive goods	Shifts demand toward income elastic goods	DEMAND FOR CHILDREN	HUMAN CAPITAL INVESTMENT	POPULATION DISTRIBUTION	DISSATISFACTION OF NON-PARTICIPANTS
+ Reduces opportunity costs	+ Facilitates internal financing	- Reduces geographic wage differentials	+ If income elasticity of demand for children > 0	+ Size of subsidy depends on family size	DEMAND FOR CHILDREN	HUMAN CAPITAL INVESTMENT	NONMARKET ACTIVITIES	NONMARKET ACTIVITIES
+ Reduces opportunity costs	+ Facilitates internal financing	- Reduces geographic wage differentials	+ Facilitates internal financing	+ Reduces risk	DEMAND FOR CHILDREN	HUMAN CAPITAL INVESTMENT	NONMARKET ACTIVITIES	NONMARKET ACTIVITIES

maintenance programs. However, for other areas, such as migration, there are several counter-balancing effects and the net result is uncertain. What is presently not available for any of the behavioral areas is very precise predictions of the magnitudes of the effects, particularly at the sub-national level. Empirical attempts to estimate the size of income maintenance program effects are still at a fairly preliminary stage in terms of yielding reliable information to policy-makers, and those research efforts that have been made have concentrated mostly on national effects. We recommend, therefore, that greater future emphasis be placed on the regional implications of proposed income maintenance programs.